Immune influence on adult neural stem cell regulation and function.

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Public Summary:

Scientific Abstract:
Neural stem cells (NSCs) lie at the heart of central nervous system development and repair, and deficiency or dysregulation of NSCs or their progeny can have significant consequences at any stage of life. Immune signaling is emerging as one of the influential variables that define resident NSC behavior. Perturbations in local immune signaling accompany virtually every injury or disease state, and signaling cascades that mediate immune activation, resolution, or chronic persistence influence resident stem and progenitor cells. Some aspects of immune signaling are beneficial, promoting intrinsic plasticity and cell replacement, while others appear to inhibit the very type of regenerative response that might restore or replace neural networks lost in injury or disease. Here we review known and speculative roles that immune signaling plays in the postnatal and adult brain, focusing on how environments encountered in disease or injury may influence the activity and fate of endogenous or transplanted NSCs.